

**What is claimed is:**

**1. A surface mount crystal unit comprising:**

**a crystal blank;**

**a planar mounting substrate made of silicon; and**

**a cover having a shape with a recessed part and made of glass**

**5 containing ions having high mobility,**

**wherein said mounting substrate and said cover are bonded by means of anode bonding,**

**said crystal blank is hermetically sealed in a case made up of said mounting substrate and said cover, and**

**10 said mounting substrate has connection electrodes used for a connection with said crystal blank.**

**2. The crystal unit according to claim 1, further comprising external terminals provided on an outer surface of said mounting substrate,**

**wherein said connection electrodes are made of a metal body, electrode through-holes which penetrate said mounting substrate are provided**  
**5 below said metal body and said external terminals and said connection electrodes are electrically connected by means of said electrode through-holes.**

**3. The crystal unit according to claim 1, further comprising:**

**external terminals provided on an outer surface of said mounting substrate; and**

**5 conductive paths made of aluminum arranged on a surface of said mounting substrate and traversing a bonded surface through said anode**

bonding,

wherein said connection electrodes and said external terminals are electrically connected by means of said conductive paths.

4. The crystal unit according to claim 1, wherein said connection electrodes are made up of a polycrystalline silicon layer provided on a surface of said mounting substrate, electrode through-holes which penetrate said mounting substrate are provided below said connection electrodes and said
- 5 external terminals and said connection electrodes are electrically connected by means of said electrode through-holes.

5. The crystal unit according to claim 4, wherein said crystal blank is electrically connected with said connection electrodes through bumps.

6. The crystal unit according to claim 1, wherein said ions having high mobility are  $\text{Na}^+$  ions or  $\text{Li}^+$  ions.

7. A surface mount crystal unit comprising:
- a mounting substrate having external terminals and connection electrodes and forming a portion of a case; and
- a crystal blank electrically and mechanically connected to said
- 5 connection terminals and hermetically sealed in said case,
- wherein said connection electrodes are made up of metal bodies and said connection electrodes and said external terminals are electrically connected through electrode through-holes provided below said metal bodies which penetrate said mounting substrate.

8. A surface mount crystal oscillator comprising:  
a crystal blank;  
a planar mounting substrate made of silicon in which an oscillation  
circuit using said crystal blank is integrated; and  
5 a cover having a shape with a recess and made of glass containing  
ions having high mobility,  
wherein said mounting substrate and said cover are bonded by means  
of anode bonding and said crystal blank is hermetically sealed in a case made  
up of said mounting substrate and said cover.

9. The crystal oscillator according to claim 8, wherein connection  
electrodes used for an electrical connection with said crystal blank and IC  
terminals including at least a power terminal, output terminal and grounding  
terminal are provided on one surface of said mounting substrate, external  
5 terminals for external mounting are provided on the other surface of said  
mounting substrate, and said IC terminals and said external terminals are  
electrically connected through electrode through-holes provided on said  
mounting substrate.

10. The crystal oscillator according to claim 9, wherein said electrode  
through-holes are provided in accordance with bonding positions of said anode  
bonding, whereby one end thereof is closed.

11. The crystal oscillator according to claim 9, further comprising:  
metal bodies provided on one surface of said mounting substrate; and  
conductive paths which connect said IC terminals and said conductive

terminals,

- 5                wherein said electrode through-holes are blocked by said metal bodies.

12. The crystal oscillator according to claim 8, wherein connection electrodes used for an electrical connection with said crystal blank and IC terminals including at least a power terminal, output terminal and grounding terminal of said oscillation circuit are provided on one surface of said mounting
- 5    substrate, external terminals for external mounting are provided on the other surface of said mounting substrate, conductive paths made of aluminum which traverse a bonded surface by said anode bonding are provided on the surface of said mounting substrate, and said IC terminals and said external terminals are electrically connected by said conductive paths.

13. The crystal oscillator according to claim 9, wherein said electrode through-holes are blocked by a polycrystalline-silicon layer provided on a surface of said mounting substrate.

14. The crystal oscillator according to claim 13, wherein said IC terminals and said connection electrodes are formed of polycrystalline-silicon.

15. The crystal oscillator according to claim 14, wherein said crystal blank is electrically connected with said connection electrodes through bumps.

16. The crystal oscillator according to claim 8, wherein said ions having high mobility are  $\text{Na}^+$  ions or  $\text{Li}^+$  ions.